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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,401	10/29/2003	Tony J. Keeton	ASMEX.419A	7477

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EXAMINER	
DHINGRA, RAKESH KUMAR	
ART UNIT	**PAPER NUMBER**
1763	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	03/13/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 03/13/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/697,401	KEETON ET AL.	
	Examiner	Art Unit	
	Rakesh K. Dhingra	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *23-26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22 and 27-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-22, 27-29 have been considered but are moot in view of the new ground(s) of rejection as explained under.

Applicant has amended claims 1, 12, 18, 27 by adding new limitations, for example in claim 1 – " radially inward of an outer edge of the recessed pocket, the support element being" and "the support plane located above an uppermost surface of a portion of the recessed pocket radially inward of the support element".

New reference (US Patent No. 6,464,790 – Sherstinsky et al) has been found that when combined with Yudovsky et al (US patent No. 6,248,176) reads on claim limitations of claims 1, 18, 27. Accordingly claims 1, 18, 27 have been rejected under 35 USC 103 (a) as explained below. Claim 12 has been rejected under 35 USC 103 (a) as being unpatentable over Sherstinsky et al in view of Yudovsky et al and Goodman as explained below. Further, dependent claims 2-11, 13-17, 19-22, 28 and 29 have also been rejected under 35 USC 103 (a) as explained below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 6, 7, 18-20, 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherstinsky et al (US Patent No. 6,464,790) in view of Yudovsky et al (US Patent No. 6,248,176).

Regarding Claims 1, 18, 19, 27, 28: Sherstinsky et al teach a substrate support member 30 (Figures 2, 3) comprising:

A recessed pocket (comprising of recessed areas 60, 62);

a support element (comprising of raised portions 52, 56, 58) radially inward of an outer edge of the recessed pocket, the support element being configured to support a substrate of a particular size in a support plane defined by the support element, the support plane 56 located above an uppermost surface of a portion of the recessed pocket 60 radially inward of the support element, wherein the support element (raised portions 52, 56) comprises an annular ring supporting an outer edge of the substrate when the substrate is supported on the support element (column 4, line 25 to column 6, line 10).

Sherstinsky et al do not teach that the annular ring is a veined ring and which is composed of a plurality of veins substantially angled with respect to a radial direction.

Yudovsky et al discloses an apparatus (Figs. 1-6) for processing a semiconductor substrate, comprising a substrate support member (structure) 30 configured to support a substrate 14, and a deflection member (support element) 100, wherein the deflection member 100 comprises an annular ring having plurality of grooves (veins) 106 that are substantially angled with respect to radial direction. Yudovsky et al further teach that deflection member 100 can be an integral part of support member 30. Yudovsky et al also teach that deflection member (annular veined ring) 100 can be oriented in the same horizontal plane as the upper surface 32 of the support member 30 (that is, the deflection member/annular veined ring 100 can support the outer edge of wafer 14) [Column 4, line 32 to column 7, line 65]. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide angled veins on the surface of support element (annular raised portions 52, 56) as taught by Yudosvsky et al in the apparatus of Sherstinsky et al to control the delivery of purge gas to the edge of substrate during processing (column 7, lines 1-65).

Regarding Claim 2: Yudovsky et al discloses that the deflection member (veined ring) 100 could have 100-200 veins. However it would be obvious to increase the number of veins (300 or more) for bigger diameter of ring for use with large dia. substrates like 300 mm or higher (column 7, lines 5-15).

Regarding Claims 3, 4: Sherstinsky et al teach a first annular groove 60 having uniform annular thickness and positioned radially inward from the support element 56 (Figure 2).

Regarding Claim 6: Sherstinsky et al teach a second annular groove 62 formed radially outward from the support element 56 (Figure 2).

Regarding Claim 7: Sherstinsky et al teach that vertical depth of grooves is adjustable depending upon a) thermal conductance from the substrate support 30 to substrate 34 and b) the profile of respective raised portions 52, 56, 58 (support element) {column 6, lines 22-42).

Regarding Claim 20: Sherstinsky et al in view of Yudovsky et al teach all limitations of the claim including a plurality of recesses 60, 62 in the substrate support, wherein a first of the plurality of recesses

34 is positioned radially outward of the plurality of veins (Fig. 6 – Yudovsky et al) and a second plurality of recesses 60, 62 positioned radially inward of the plurality of veins (on raised portion 52) {Figure 3 - Sherstinsky et al}.

Regarding Claim 29: Yudovsky et al teach that grooves (veins) 106 can be parabolic (curved) [column 7, lines 42-65].

Claims 5, 8-17, 21, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherstinsky et al (US Patent No. 6,464,790) in view of Yudovsky et al (US Patent No. 6,248,176) as applied to Claims 3, 20 and further in view of Goodman (US PGPUB No. 2003/0198910).

Regarding Claims 5: Sherstinsky et al in view of Yudovsky et al teach all limitations of the claim except the substrate holder comprises a substrate pocket and the first annular groove is lower than the surface of substrate pocket.

Goodman discloses an apparatus (Figure 1A, 3-5) for semiconductor processing that includes a substrate holder 200 which comprises grooved structure and has a groove G (like first annular groove) {Figure 1A}, that is positioned radially inward from the grid protrusions (like support element) 222 (Paragraph 0011). Goodman further discloses the substrate holder further comprises a substrate pocket 202 and the first annular groove is formed such that the first annular groove is lower than a surface of the substrate pocket 202 (paragraphs 0038-0046).

Sherstinsky et al, Yudovsky et al and Goodman are analogous art because they are from the same field of endeavor, namely substrate holders.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide substrate pocket as taught by Goodman in the apparatus of Sherstinsky et al in view of Yudovsky et al to provide uniform heating of the substrates and also provide proper support for the substrate (paragraphs 0008-0010).

Regarding Claim 8: Goodman discloses an annular ring raised above the substrate pocket and positioned radially inward of the support element (Fig. 4 Item 220).

Regarding Claim 9: Goodman discloses that the substrate holder is configured to be supported by a spider structure 22 comprising a vertical shaft 24 and at least three substrate holder supporters extending radially outward and upward from the shaft, the substrate holder supporters configured to support the bottom surface of the substrate holder (Figure 2 and Paragraphs 0034, 0035).

Regarding Claim 10: Goodman discloses that the bottom surface of the substrate holder includes a recess configured to receive upper ends of the substrate holder supporters of the spider structure (Fig. 3B Item 214).

Regarding Claim 11: Goodman discloses the bottom surface of the substrate holder includes a circular groove centered about a central vertical axis of the substrate holder (Fig. 3B Item 214), the circular groove configured to receive upper ends of the substrate holder supporters of the spider structure (Fig. 3B Item 214), the circular groove of the bottom surface being interrupted in one location (Fig. 3B Item 216).

Regarding Claim 12: Sherstinsky et al in view of Yudovsky et al and Goodman teach all limitations of the claim (as explained above under claim 1) including a plurality of support elements (protrusions 220) radially inward of the outer edge of recessed pocket 202). Further, Goodman also discloses a plurality of radiant heating elements configured to heat the reaction chamber (Goodman - Fig. 2 Item 14), and a substrate holder in the reaction chamber (Fig. 2 Item 20).

Regarding Claim 13: Sherstinsky et al in view of Yudovsky et al and Goodman teach that the substrate holder further comprises a substrate pocket (Fig. 4 Item 202, Goodman), and an annular groove formed in the substrate pocket and configured to surround an outer edge of the substrate (Fig. 4 Item 204, Goodman) when the substrate is supported on the plurality of support elements 106 (grooves) [Yudovsky et al, Figures 3, 6].

Regarding Claim 14: Yudovsky et al discloses that the support plane is formed by top surfaces of the substrate support 30 and plurality of spaced veins 106 (Yudovsky et al – Figures 1-6).

Regarding Claim 15: Goodman discloses that apparatus further comprises an annular recess in the substrate pocket, the annular recess positioned radially inward of the support elements (Fig. 5 Item 222).

Regarding Claim 16: Goodman discloses a support structure configured to support the substrate holder, the support structure comprising a vertical shaft 24 and a plurality of support arms 22 extending generally radially outward and upward from the shaft, the support arms having upper ends configured to support the substrate holder (Figure 2).

Regarding Claim 17: Goodman discloses that apparatus comprises an annular ring on the substrate holder, the annular ring being positioned radially inward of the support elements and having a raised surface higher than a surface of the substrate pocket but no higher than the support plane (Fig. 4 Item 220).

Regarding Claim 21: Goodman discloses that apparatus further comprises an annular ring on the susceptor, wherein the annular ring being positioned radially inward of the plurality of recesses and having a raised surface no higher than the support plane (Fig. 4 Item 220).

Regarding Claim 22: Goodman disclose an annular ring on the susceptor, the annular ring being positioned radially inward of the second of plurality of veins and having a raised surface no higher than the support plane (Goodman - Fig. 4 Item 228).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Lee et al (US PGPUB No. 2003/0209326) teach a semiconductor processing apparatus (Figure 2) comprising a susceptor 114 (substrate holder) with a recessed pocket 120; and a support structure 124 (ring shaped support element) radially inward of an outer edge of the recessed pocket, the support element

being configured to support a substrate 118 of a particular size in a support plane defined by the support element 124, the support plane located above an uppermost surface of a portion of the recessed pocket 120 radially inward of the support element (paragraphs 037-0040).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rakesh K. Dhingra whose telephone number is (571)-272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rakesh Dhingra

Parviz Hassanzadeh
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